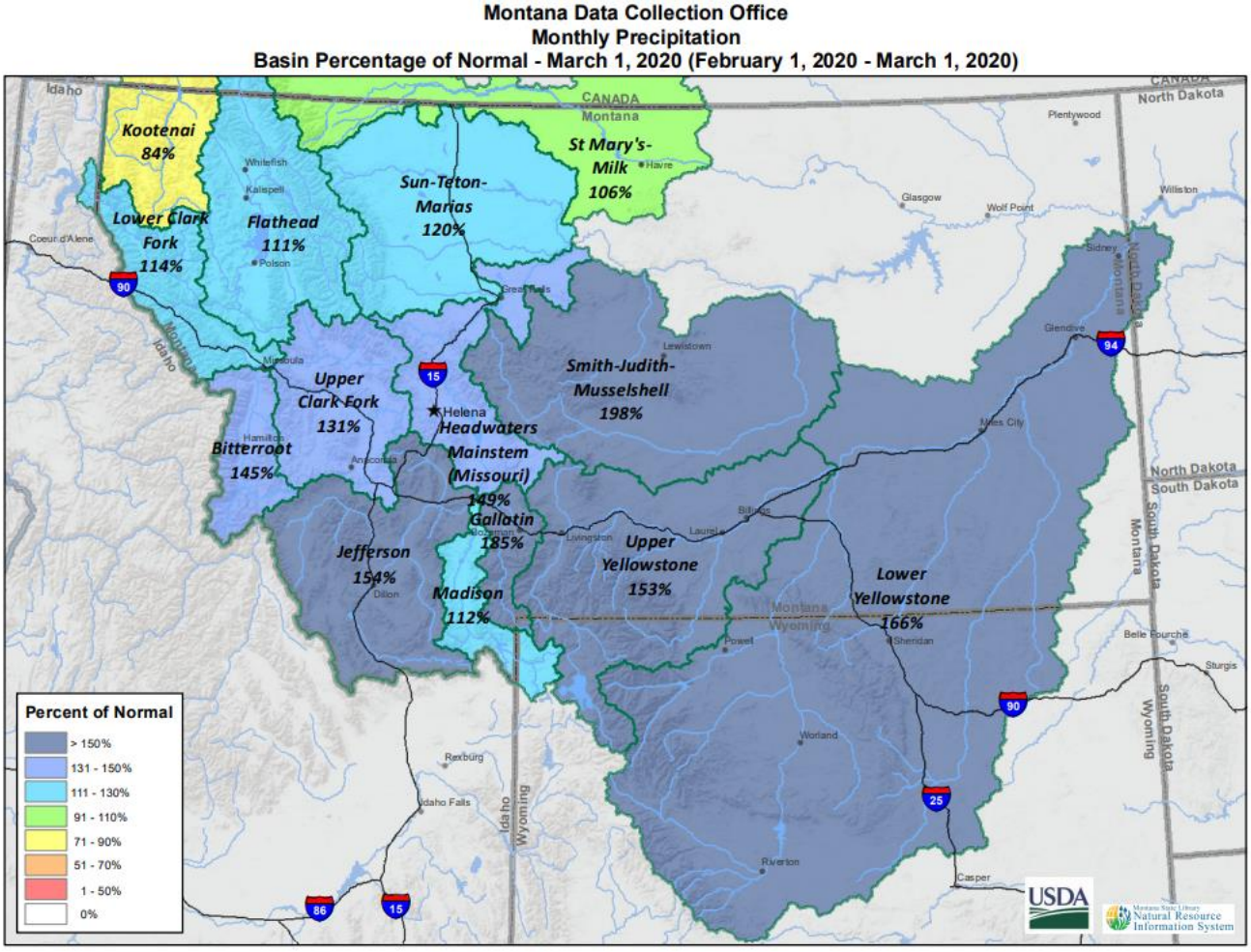
Montana Drought Forecast – Summer 2020

Drought Forecast Overview:

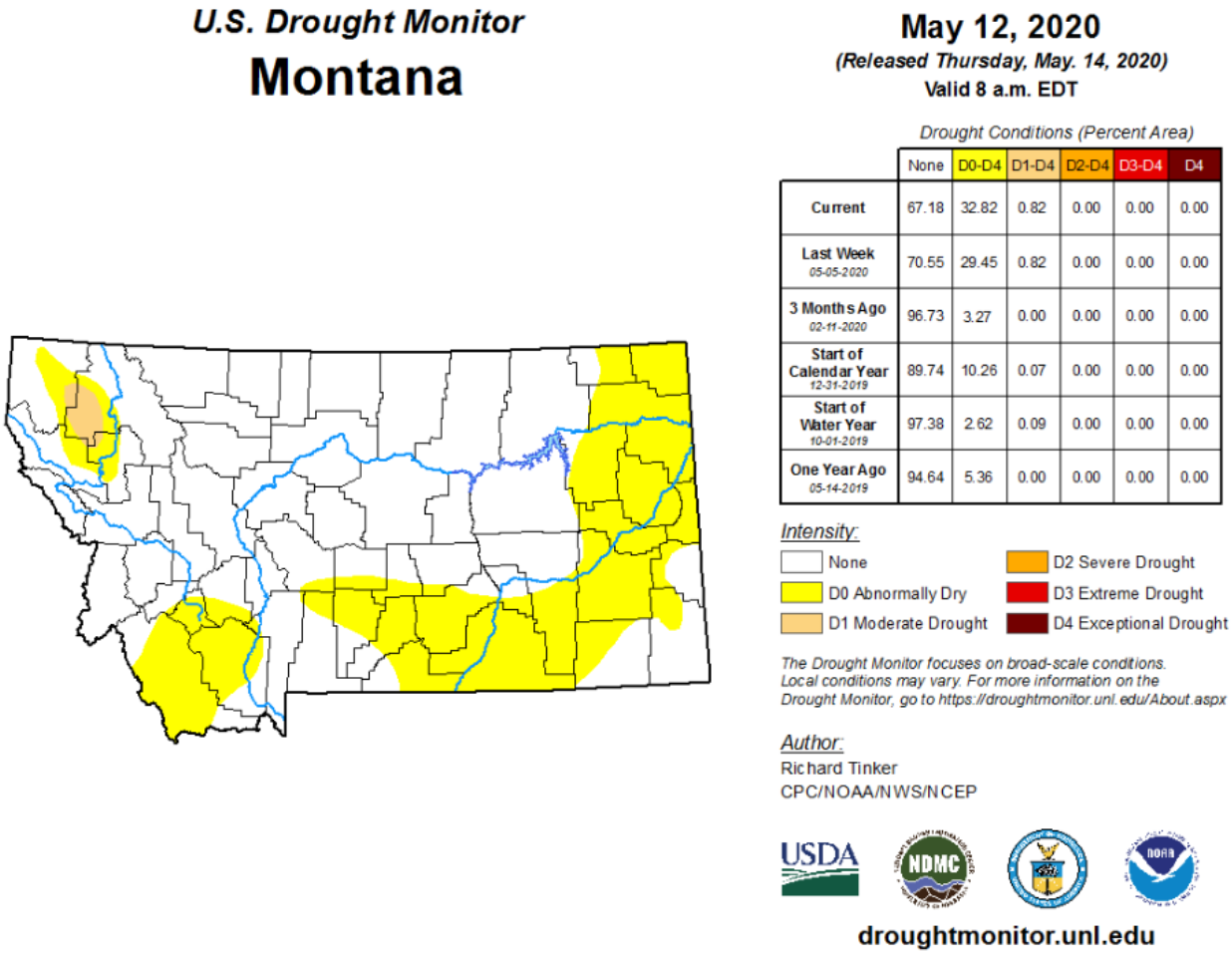
On behalf of the Governor's Drought and Water Supply Advisory Committee, DNRC's Water Management Bureau has compiled this Drought Forecast Report. This report provides a synopsis of the status of current and projected weather, hydrologic and terrestrial conditions statewide and attempts to forecast the potential for drought development for the remainder of the summer. This document offers links to additional resources with more in-depth information. In partnership with other state and federal agencies, DNRC staff gather this information from experts in climate science, snowpack, streamflow, soil moisture and local drought impact reports to ascertain the status and forecast of drought conditions for the next several months.

Winter of 2020:



The exceptionally wet fall in late 2019 moved Montana into drought free status in December 2019 for the first time since late 2011. That condition was short lived due to an unusually dry December and January. However, strong to near record precipitation across much of the state in February boosted snowpack and offered encouraging signs for the coming spring. Precipitation patterns in March and April made conditions particularly

difficult to evaluate. Despite a strong snowpack at the higher elevations, the persistence of unusually warm and dry conditions at low and mid-elevations led to sparse snow cover across the mountain valleys and prairie.

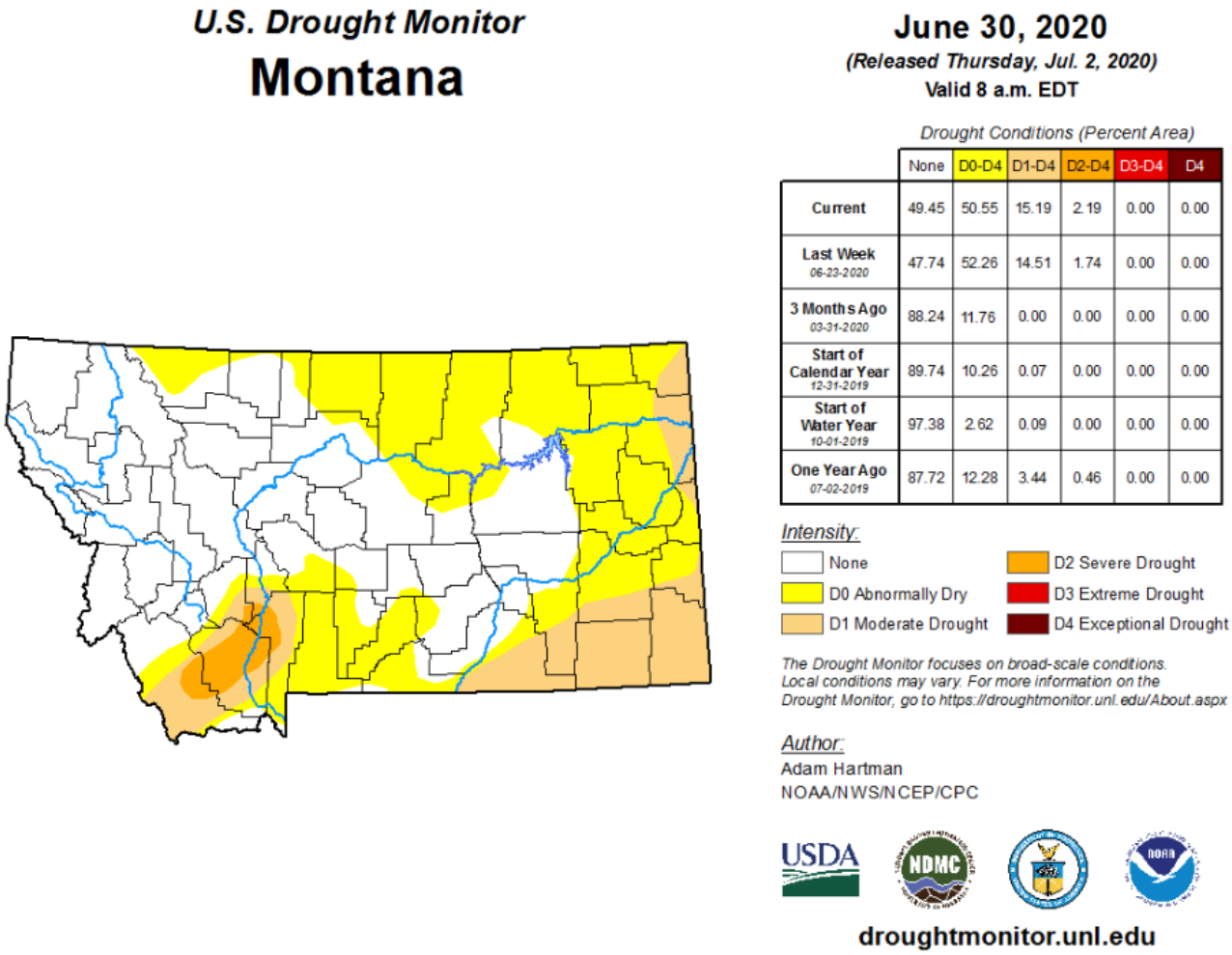


By late April and early May abnormally dry conditions began to develop in northwestern Montana and spread slowly across central and far eastern portions of the state (see map above). The drying trend continued across much of the state except for northwestern Montana where significant rain/snow events in the latter part of May and early June has all but erased precipitation deficits in this area.

Current Conditions:

Abnormally dry to moderate and severe drought conditions developed quickly across the state in May and June this year. The southern tier of the state, eastern and north central parts of Montana received much below normal precipitation during this critical juncture. Southwestern Montana was particularly hard-hit succumbing to D1 (moderate) and D2 (severe) drought across much of the region. Recall that this area received near record snowfall in February putting snowpack at much above normal for that point in the season (see map on previous page). However, in evaluating prospects for summer conditions, it is especially important to keep in mind that April, May and June are generally Montana's wettest months of the year, particularly on the eastern side of the continental divide. Good snowpack in the mountains is usually a good indicator for Montana's stream flows. But adequate moisture at the onset of the growing season is critical for range, forest, and riparian habitats in addition to the success of dryland agriculture that dominates much of Montana. Ample spring and early summer moisture is also

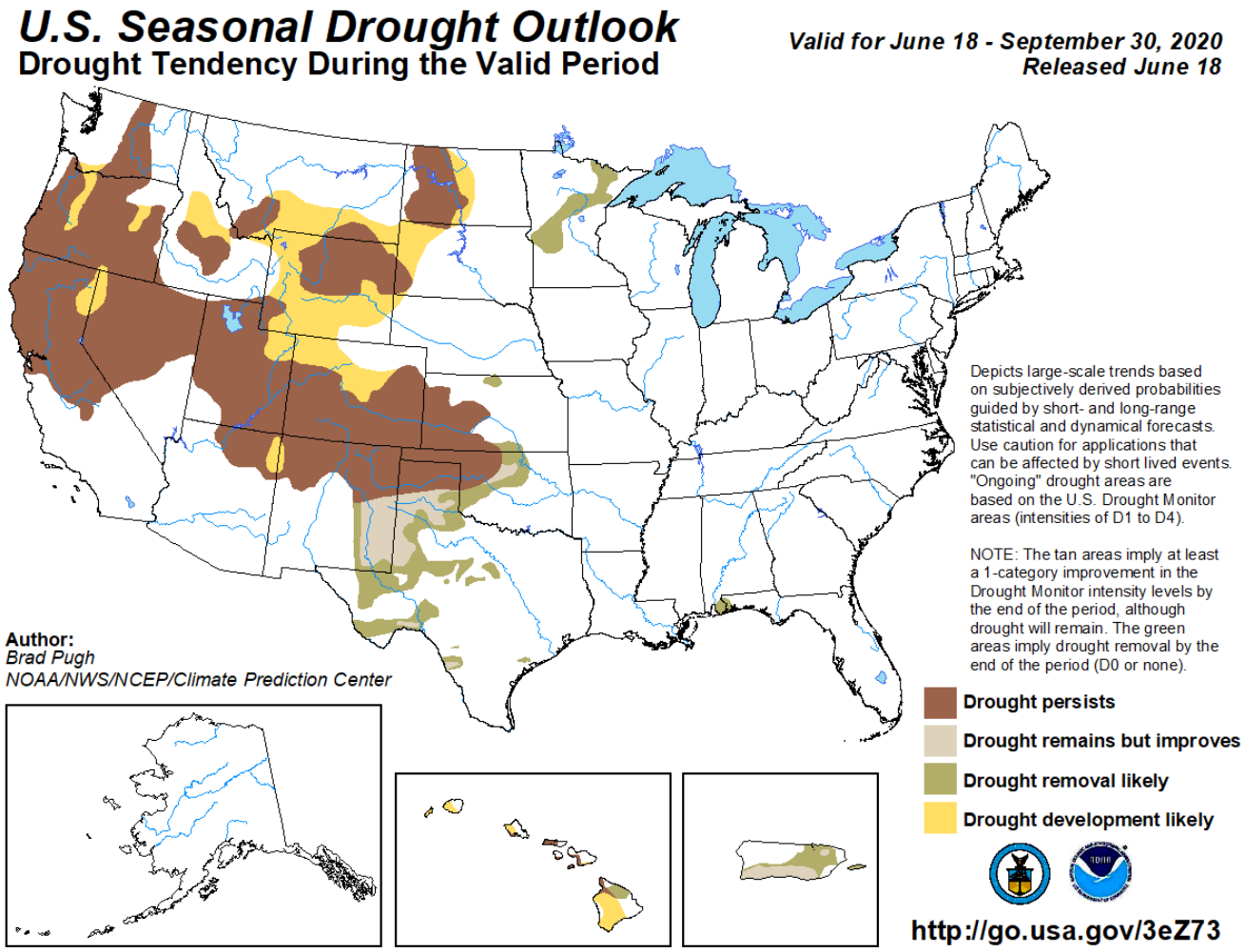
important for Montana's reservoirs, lakes, and rivers. This timely precipitation blooms the upland range and prairies and helps to subdue the late summer fire seasons that so commonly occur. It also explains the adage, "Montana is nearly always two weeks away from a drought." Absent good moisture in April, May and June, much of Montana would look similar to the drier parts of Nevada.



Seasonal Drought Forecast:

This summer's seasonal drought outlook provided by NOAA's Climate Prediction Center closely mirrors the current U.S. Drought Monitor Map (above). With drought developing quickly in Southwest Montana and drought in northern Wyoming spilling into the southern reaches of Montana, drought conditions will likely worsen across all of Montana's southern tier and along the eastern border. Heavy rains in early and mid-June were not enough to overcome longer term deficits in these areas. With the onset of July, the potential for season changing precipitation events diminishes greatly. Following the 4th of July holiday, precipitation across much of the state commonly "shuts off" adding to concerns of drought development given the status of current conditions. The potential for drought development in north central Montana is unclear at this point. While the eight to 14-day outlook indicates chances for above normal precipitation across most of the state, above normal temperatures and below normal precipitation forecast for July does not offer good hope for relief at this point. The 3-month forecast, though not always as accurate as shorter-term outlooks, forecasts above normal temperatures and below normal precipitation. As the summer progresses, the evaluation of drought conditions becomes more difficult. Montana's drought monitoring group relies on reports from the field to inform decision making.

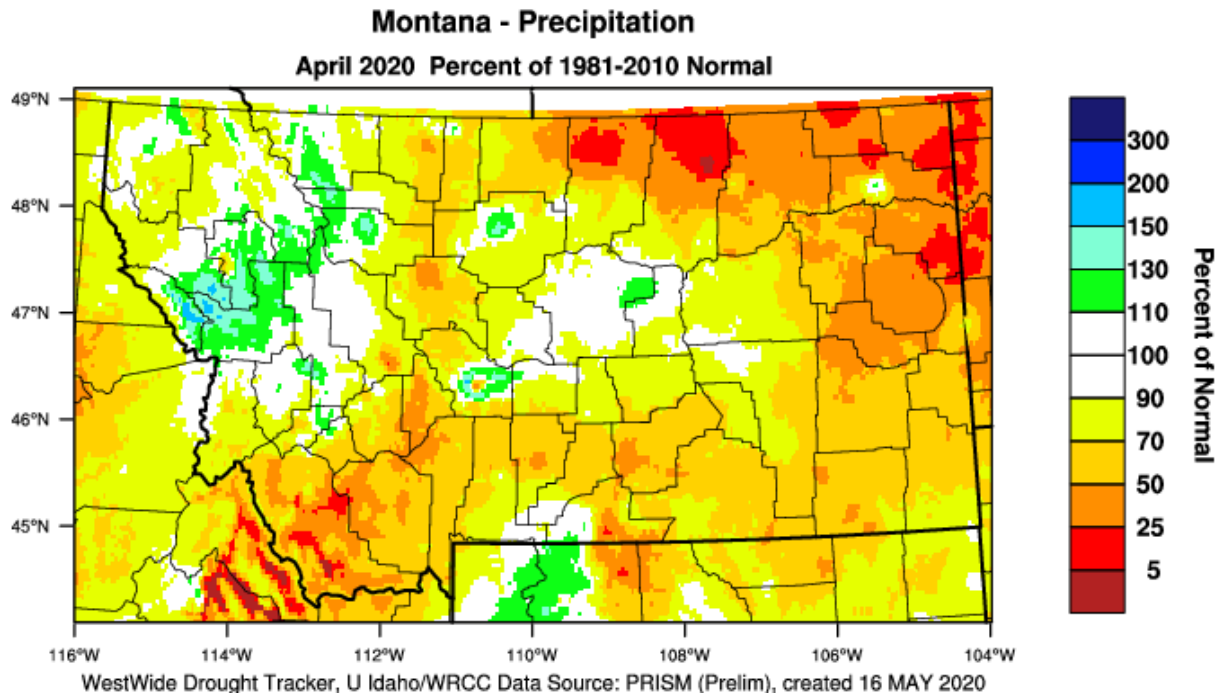
Producers, recreationists, land managers and others can provide site specific reports of conditions through the Montana Drought Impact Reporter. Maps, links and other drought information specific to conditions in Montana is provided there also.

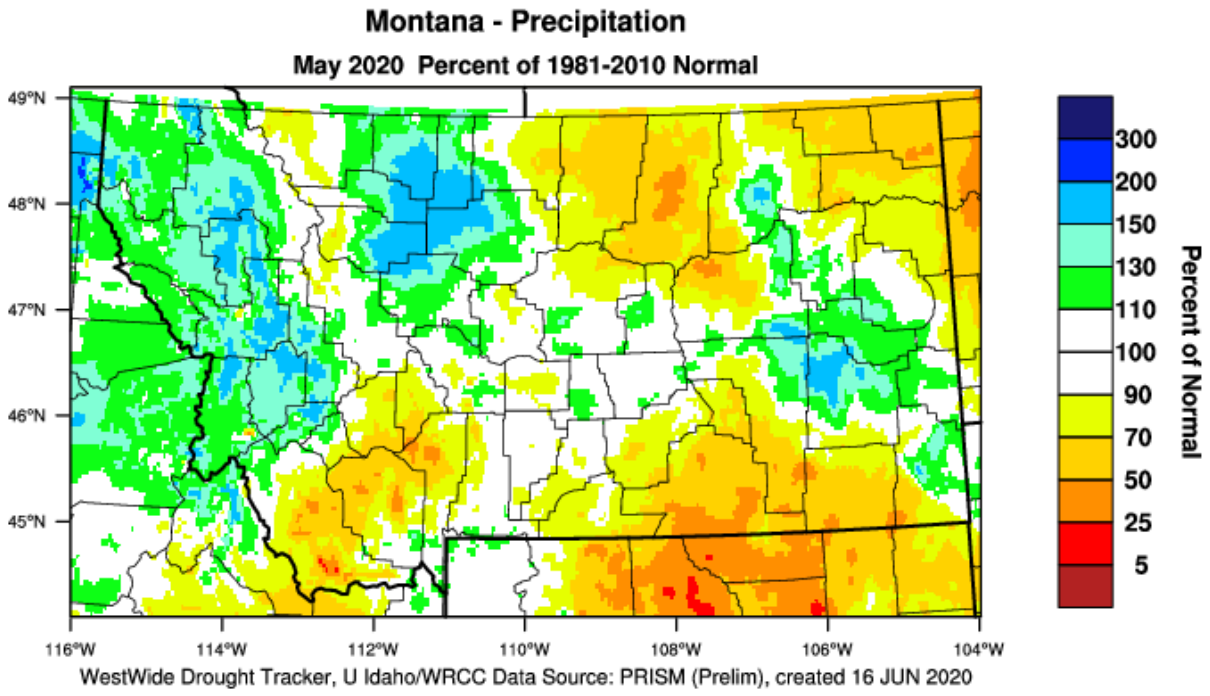


Spring Weather Summary:

Weather patterns during the first three weeks of April were dominated by dry, but cool, west-northwest flow. Although snowpack gains were below normal, the above to well above normal snowpack in place on April 1st held strong through the end of the month due to the below-average temperatures. Although temperatures were above average in many locations during the last week of the month, daily average temperatures were below average across Montana for April as a whole.

The first two weeks of May yielded near to slightly below average daily temperatures at mountain locations across the state, with moist western flow delivering cool air to most areas and above-normal precipitation in river basins west of the continental divide. During the first three weeks of May, mountain temperatures were near to slightly below average, prolonging snowmelt in many locations. The last week of May would mark a major pattern change across the state, one that would set new high daily average temperatures at many mountain and valley locations. However, storm events in May and early June did erase many of the precipitation deficits on the west side of the continental divide, relieving conditions that had earlier appeared as the most drought prone area in the state.

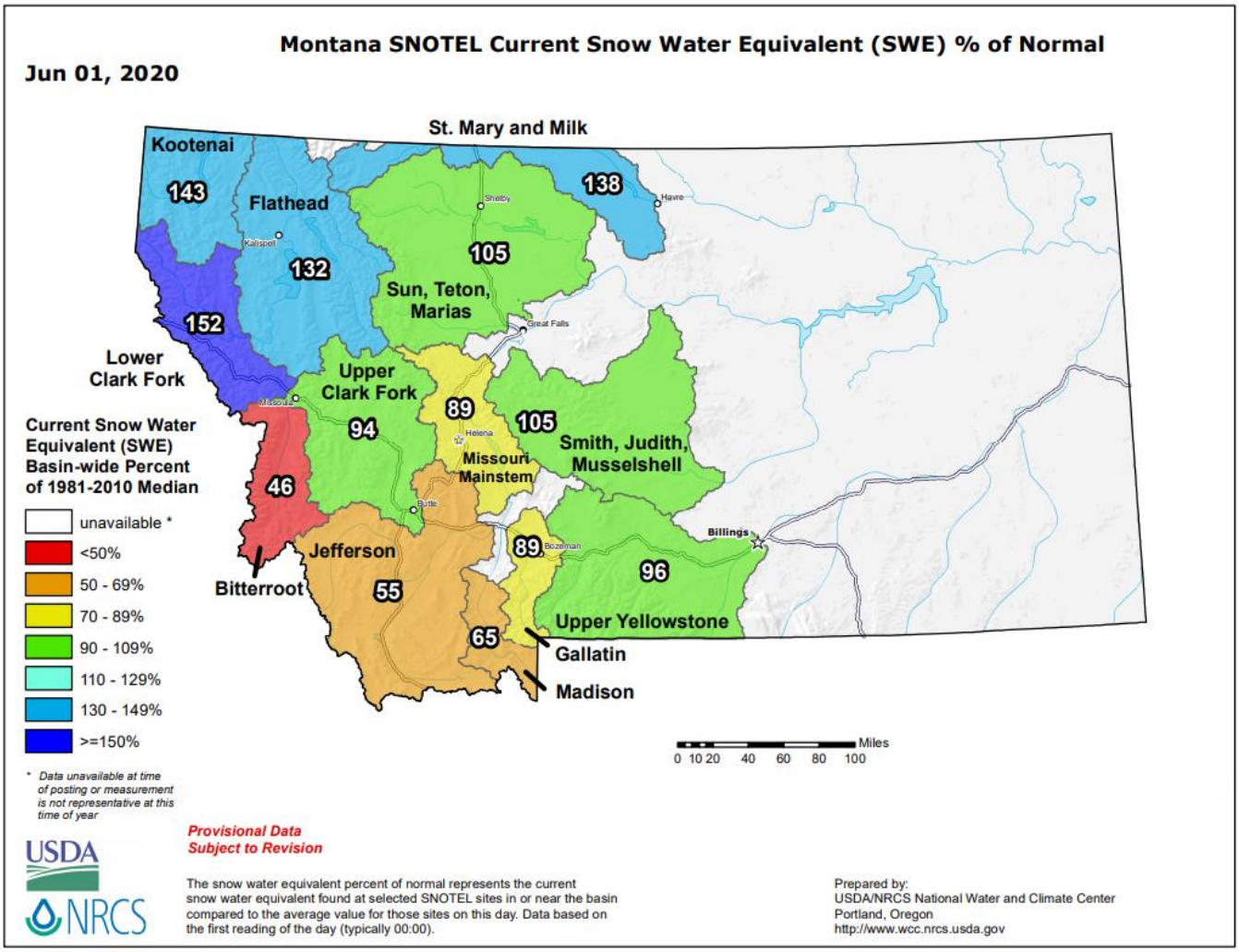




Snowpack – Overview:

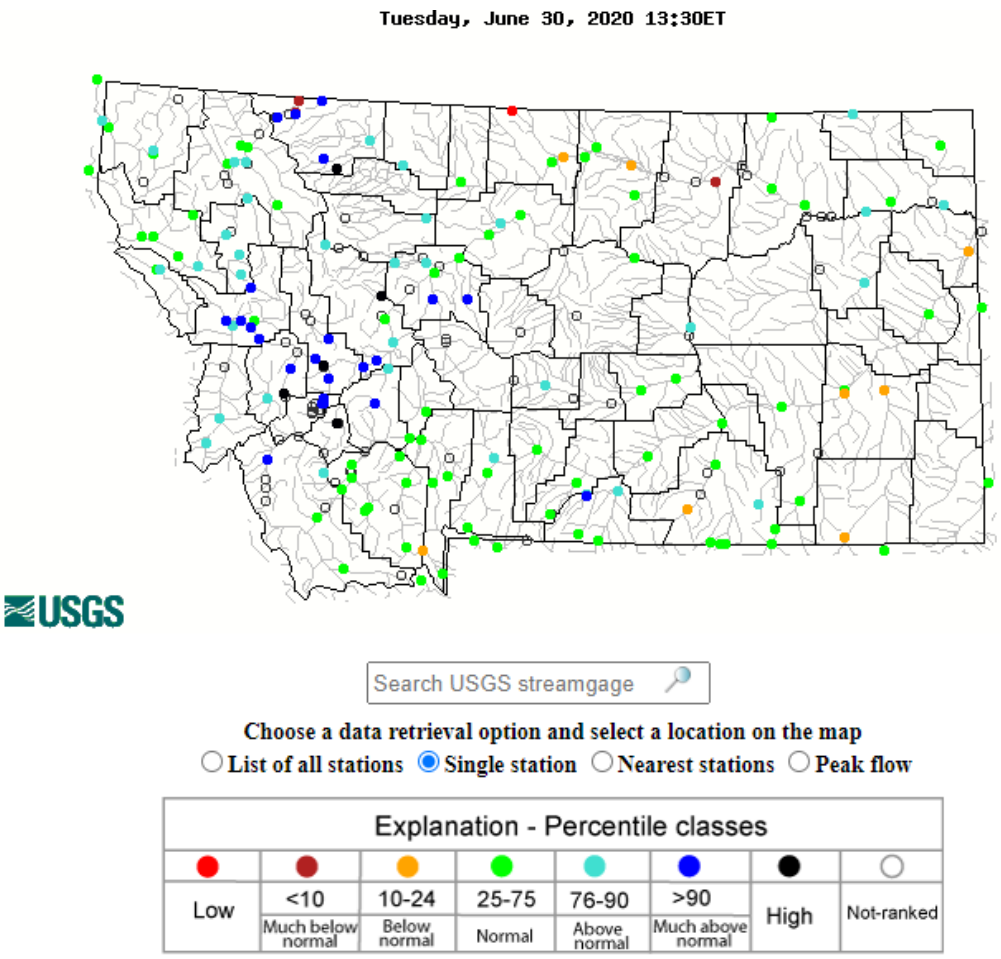
Snow totals across the state on June 1st varied widely due mainly to weather patterns in May. Most river basins experienced a peak snowpack in late April this year that was near to slightly above normal. Throughout May, snowmelt occurred at all elevations. The melt accelerated rapidly across the state during the last week of May and the first week of June moving a significant amount of snow water into rivers and streams. In the Madison, Jefferson, and Bitterroot River basins, this early melt resulted in a snowpack that was well below normal. Elsewhere in the state, snowpack remained near to slightly above normal. Rapid snowmelt at the end of May and

the beginning of June has decreased the long-term availability of snow water to river systems later this summer. The early pass-through of water on non-reservoir-controlled systems means that less water will be available when irrigation demand is highest later in the summer, making irrigators more reliant on summer precipitation, which typically declines through the summer months. Water users along reservoir-controlled river systems may not feel the same impact, as reservoirs have been able to store much of this runoff.



Streamflow: (DNRC/USGS/MBMG Gaging Stations, Missouri Basin Forecast Center, Northwest River Forecast Center)

Streamflow forecasts issued on June 1st for the June 1st – September 30th period range widely this year. While some areas might still anticipate near to above-normal water yield in northern and central Montana, some areas in southwest Montana look to experience below-average volumes due to the rapid melt during May and June. The below normal stream gage readings (red and orange dots shown below) identified along the Highline are due to collapse of Drop 5 on the St. Mary's canal which transfers water from the St. Mary basin to the Milk River Basin. Please see a more detailed discussion below.



Reservoirs: (Bureau of Reclamation Reservoirs, State Reservoirs)

Water elevations at state water projects across Montana are currently normal to above normal as of July 1st. Ample snowpack and some timely storm events in June have filled most of Montana's reservoirs. Conditions at the smaller irrigator-controlled reservoirs across the State are also trending above normal. Carryover storage from last year's ample runoff and wet fall, combined with this year's average to above average conditions, has delivered full storage in most areas of the state. Localized shortages at smaller reservoirs may occur across southern and eastern parts of the state with the onset of drought conditions in those areas.

St Mary / Milk River Diversion Failure:

On Sunday, May 17, a concrete drop structure failed on the Bureau of Reclamation's Milk River Project St. Mary Canal northwest of the town of Cut Bank in northern Montana, located on the Blackfeet Indian Reservation. This structure is the last of five drop structures that use gravity and siphons to convey water from the St Mary river through the 29-mile long St. Mary Canal to the North Fork of the Milk River. The water then travels into the Milk River, crosses the Canadian border and then flows back into the United States to support irrigation, domestic use, recreation, fish, wildlife and habitat.

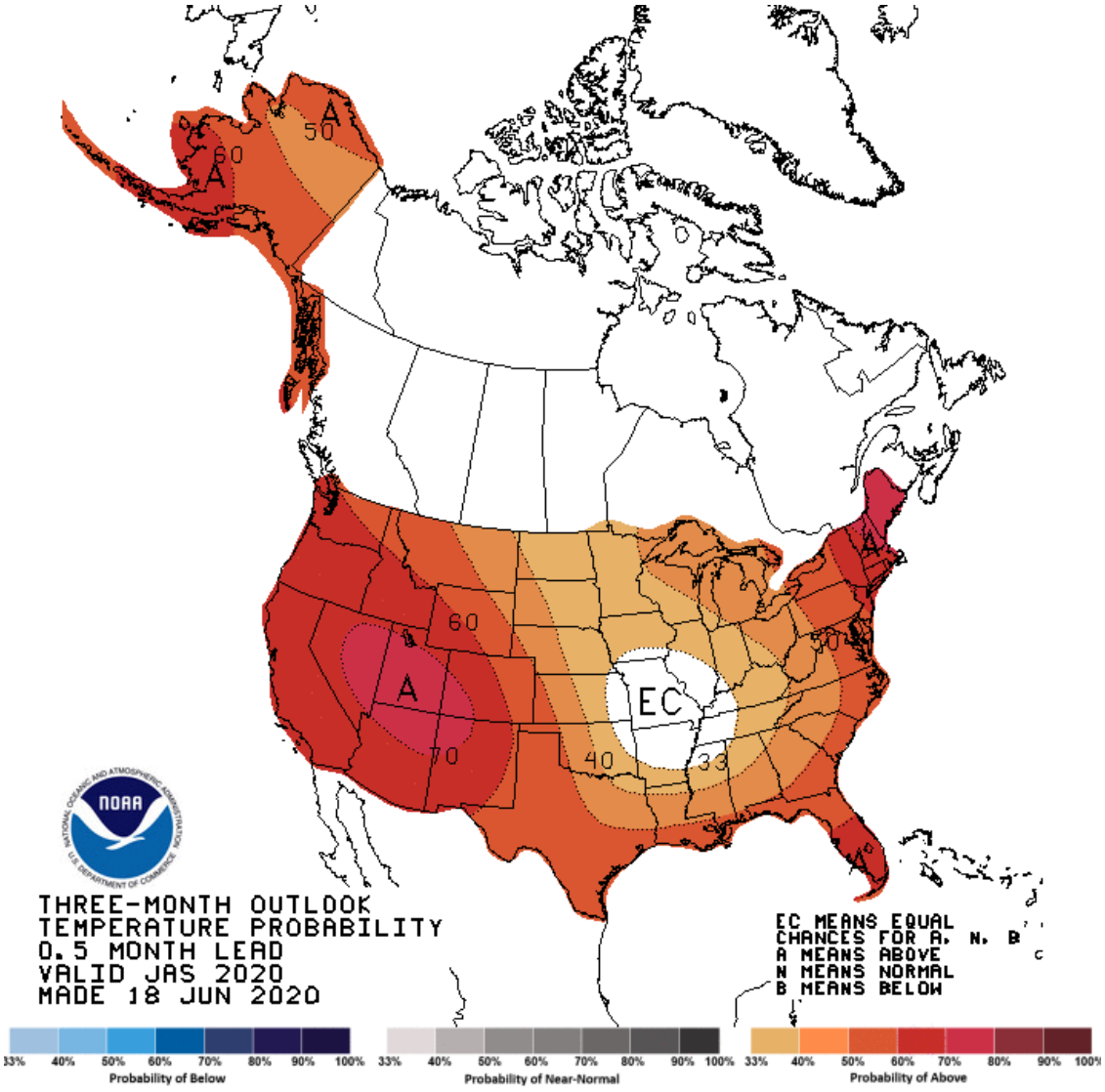
The St. Mary Canal supplies the main source of water for irrigators on the Milk River. The Milk River Project also provides drinking water for Havre, Chinook, Harlem, Hill County, the North Havre Water District, and the Fort

Belknap Agency and water for non-project irrigators. Storage in Fresno Dam and Nelson Reservoir is being used to provide continued irrigation and municipal deliveries. Irrigation allotments have been reduced by 50% and irrigation from the Milk River is anticipated to end by mid-July impacting irrigation of over 145,000 acres. Impacts to domestic supplies are not currently anticipated at this time. Parts of north central Montana are abnormally dry this year. In these areas, impacts due to the loss of St. Mary water could be especially severe in the event of continued dryness. Potentially higher than normal temperatures this summer would worsen the problem.

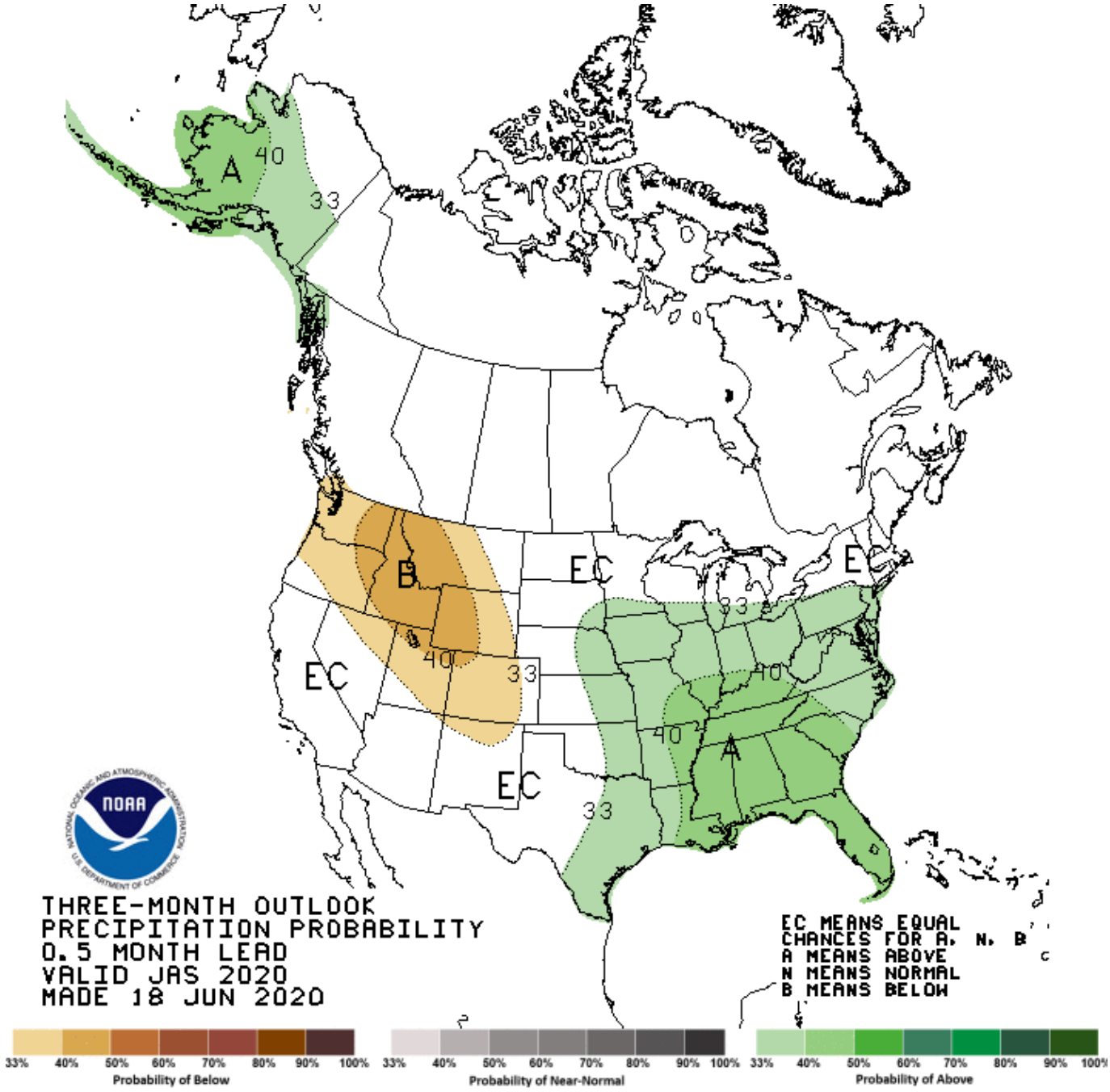
Long Term Weather Forecast:

The Climate Prediction Center, a division of the National Weather Service, provides long-term forecasts for the contiguous United States, Alaska and Hawaii. The current temperature outlook for June, July and August calls for 40% to 50% chance of above normal temperatures across much of Montana. The precipitation outlook indicates below normal precipitation across much of the state with eastern Montana not showing a clear indication in one direction or the other. The maps below show the 3-month forecast for both temperature and precipitation.

3 Month Temperature Forecast:



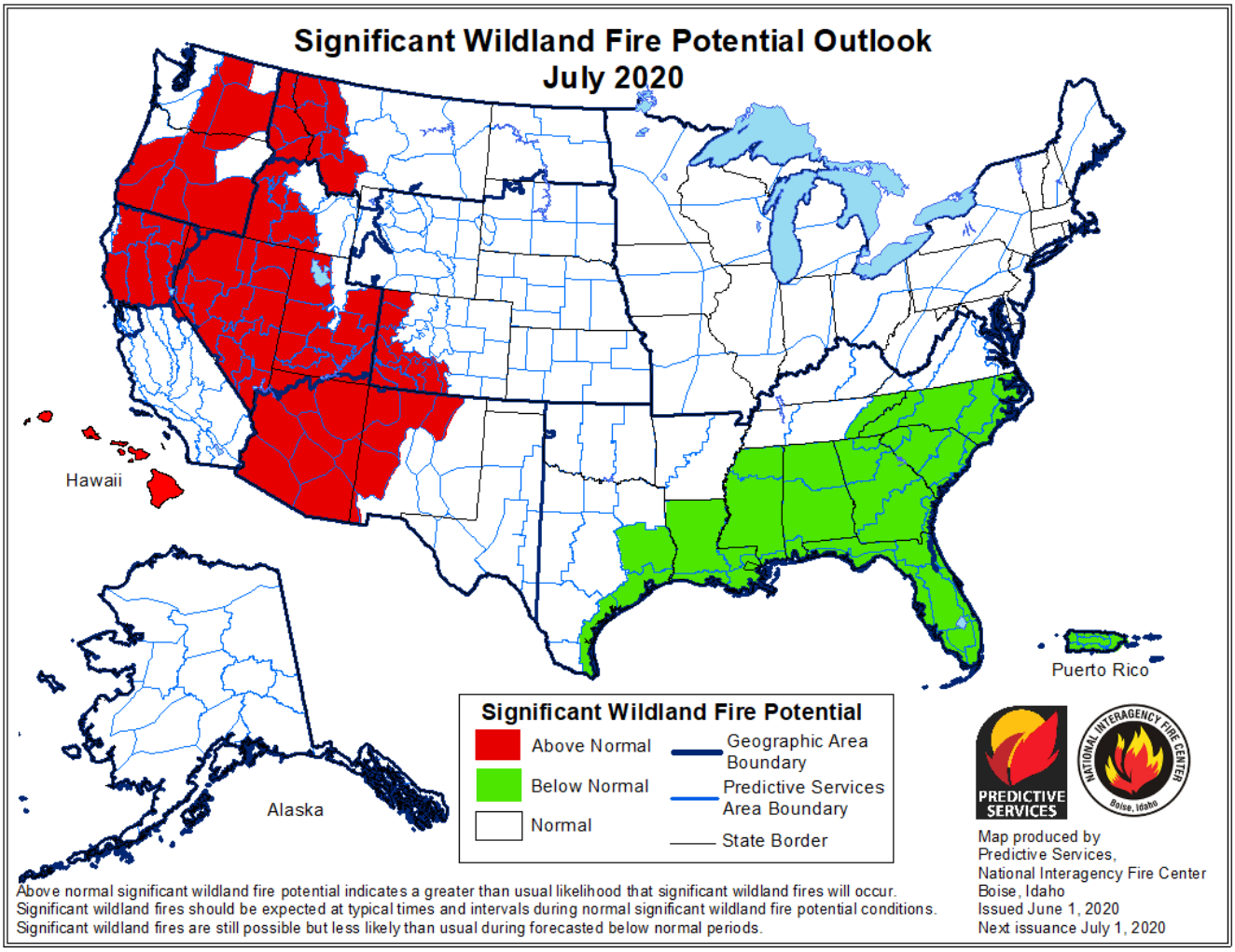
3 Month Precipitation Forecast:

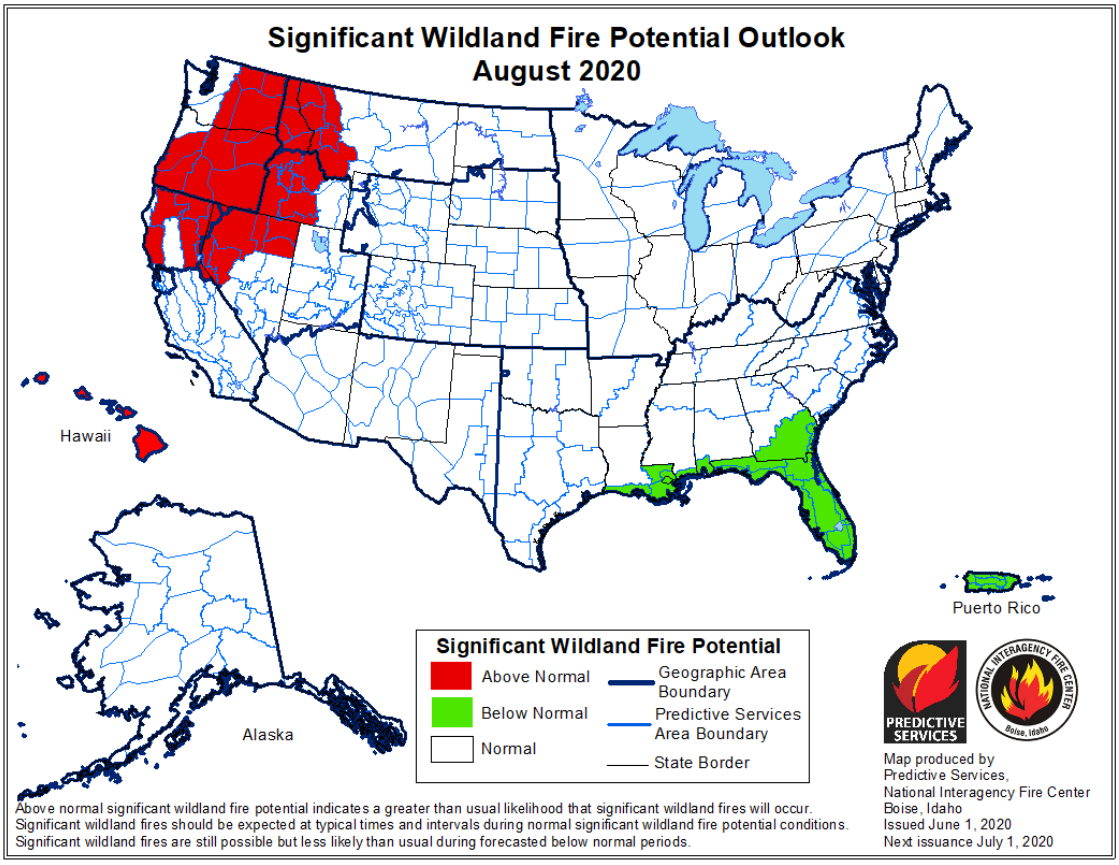


Wildfire Outlook:

Above Normal significant large fire potential is expected in the areas shown on the maps below due primarily to increasing drought conditions, early loss of mountain snowpack, anticipated lightning activity, and overall hot and dry conditions that should persist through August. As is typically the case, the peak season fire activity across the northwestern portion of the country should diminish by mid-September as the seasonal transition begins and allows for wet fronts to begin to bring precipitation to impacted areas.

Normal significant large fire potential is expected across the region during June followed by Above Normal fire potential for western Montana and northern Idaho for July, August, and September. Eastern Montana and the Dakotas can expect Normal significant large fire potential during the outlook period.





Much of the information contained in this report comes from the NRCS Water Supply Outlook Report, U.S. Drought Monitor, Climate Prediction Center, National Integrated Drought Information System , National Interagency Fire Center and others. This report would not be possible without the ongoing participation and contributions of our local, university, state, tribal and federal partners, some of which are listed below:

This report was developed by the MT DNRC on behalf of the Governor's Drought & Water Supply Advisory Committee pursuant to MCA 2-15-3308(5). For more information contact: Michael Downey, mdowney2@mt.gov , (406) 444-9748.